WHAT IS CLAIMED IS

1. A biochip reader that reads fluorescence generated from genes of each of its cells by irradiating each cell with coherent light such as laser light as the excitation light; comprising

a rotation plate formed so as to be rotatable, on which a plurality of microlenses is arranged, and

a two-dimensional detector that detects a fluorescence image of said biochip using detector elements arranged in a two-dimensional manner; further configured to rotate said rotation plate, to scan said biochip with light using excitation light beams individually condensed with a said plurality of microlenses, and to individually irradiate each cell.

2. A biochip reader in accordance with claim 1, which is of the transmission type or the reflection type.

3. A biochip reader, configured to irradiate a sample whose surface is flat with excitation light, to form images of fluorescence generated from fluorescent substances in the sample via an image-forming optical system, and to read the images with a detector;

wherein a barrier filter which acts to transmit fluorescence from said sample surface but to attenuate excitation light reflected from said sample is arranged in said image-forming optical system so that excitation light reflected from said sample is incident to the barrier filter at an incident angle of ±5 degrees or less.

4. A biochip reader in accordance with claim 3, wherein said barrier filter is arranged between the image-forming lens in said image-forming

optical system and said detector to detect images formed with this image-forming lens.

5. A biochip reader in accordance with claim 3, wherein the irradiation angle of excitation light based on the light source in Koehler's illumination is configured to be ±5 degrees or less.

6. A biochip reader in accordance with claim 3 or claim 4, wherein, if a sample is irradiated using a light source array generating a plurality of excitation light beams whose wavelengths are different from each other, the barrier filter, to which the reflected excitation light is incident, based on excitation light that is incident to a sample at an incident angle γ, is arranged oblique to said sample surface at angle γ.

7. A biochip reader configured to irradiate excitation light to a sample, to form an image of fluorescence generated from fluorescent substances in said sample via an image-forming optical system, and to read that image with a detector;

wherein the image-forming lens in said image-forming optical system is fabricated as a convex lens, on whose flat side is formed an interfering filter for fluorescence.

8. A biochip reader configured to irradiate excitation light to a sample, to form an image of fluorescence generated from fluorescent substances in said sample via an image-forming optical system, and to read that image with a detector;

wherein mixing of excitation light into the detector side is prevented by mounting a mask, that has approximately the same area as that for

the diameter of said excitation light beam and masks the excitation light focused with the objective lens, in said image-forming optical system.

9. A biochip reader configured to irradiate excitation light to a sample, to form an image of fluorescence generated from fluorescent substances in said sample via an image-forming optical system, and to read that image with a detector;

wherein mixing of excitation light into the detector side is prevented by mounting a mirror, that has approximately the same area as that for the diameter of said excitation light beam and reflects the excitation light focused with the objective lens, in said image-forming optical system.

10. A transmission type fluorescence reader configured to irradiate excitation light to a sample, to form an image of fluorescence generated from fluorescent substances in said sample via an image-forming optical system, and to read that image with a detector;

wherein one barrier filter (or two barrier filters) which act(s) to transmit fluorescence from said fluorescent substances but attenuate excitation light passing through said sample, is (are) arranged between the sample and objective lens in said image-forming optical system or immediately before said detector (or in both positions), so that the excitation light passing through said sample is incident to the barrier filter at an incident angle of ±5 degrees or less.

11. A biochip reader that reads fluorescence generated from genes of each of its cells by irradiating each cell with coherent light such

as laser light as the excitation light; comprising

a rotation plate formed so as to be rotatable, on which a plurality of microlenses is arranged,

a two-dimensional detector that detects a fluorescence image of said biochip using detector elements arranged in a two-dimensional manner, and

a barrier filter positioned in the image-forming optical system that forms an image on the detector surface by detecting fluorescence from said biochip;

further configured to rotate said rotation plate, to scan said biochip with light using excitation light beams individually condensed with a said plurality of microlenses, to individually irradiate each cell on said biochip, and at the same time to make said excitation light to be incident to said detector side incident to said barrier filter at an incident angle of ±5 degrees or less.

12. A biochip reader that irradiates excitation light from a light source to a plurality of cells of the biochip respectively via a plurality of microlenses and reads fluorescence image information from genes to which fluorescent substances are stuck and which are poured into a said plurality of cells with a detector; wherein

said light source is configured to generate excitation light composed of a part of strong light intensity and another part of weak light intensity, and

on said biochip, genes of each cell are arranged so that genes are expressed less at the strong light intensity part and are expressed

more at the weak light intensity part.

13. A biochip reader in accordance with claim 12, wherein said light source is configured to generate excitation light that gives a light intensity distribution in which the intensity is strong at its center part and weak at the peripheral part.

14. A biochip reader in accordance with claim 12 or claim 13, wherein a mask that cuts or attenuates part of excitation light is arranged between said light source and said sample.

15. A biochip reader in accordance with any of claims 12 to 14, wherein a zoom mechanism for changing the light intensity distribution of excitation light from said light source corresponding to expression of genes on said biochip, is provided.

16. A biochip reader that irradiates excitation light from a light source to a plurality of cells of the biochip respectively via a plurality of microlenses and reads fluorescence image information from genes to which fluorescent substances are stuck and which are poured into a said plurality of cells with a detector; wherein

said detector is composed of detector elements having a characteristic in which output values are logarithmic to input values.